2673 AG BT 01-11-02

In the United States Patent and Trademark Office

Ser. Num. 09/882,826
Appn. Filed 06/16/2001
Applicant: Che-Chih Tsao
Appn. Title Pattern projection techniques for volumetric 3D displays and 2D displays
Examiner:
Grp Art Unit 2673

Mailed:
At:

Information Disclosure Statement

Commissioner of Patents and Trademarks
Washington DC 20231

Sir:

Attached is a completed Form PTO-1449 Substitute and copies of the pertinent parts of the references listed on this form. Comments on each of those references are as follows:

Tsao et al. (U.S. patent 5,754,147) describes a volumetric 3D display with an optical interfacing mechanism, which smoothly delivers whole frame images created on a stationary projection device onto a rotating screen and allows creation of volumetric 3D images using conventional 2D projection optics.

Tsao (U.S. patent 5,954,414) describes volumetric 3D displays with different optical interfacing mechanisms that smoothly deliver whole frame images created on a stationary projection device onto a reciprocating screen.

Thompson & DeMond describes a volumetric 3D display system that projects images composed by collimated light beams directly to a moving screen. A spatial light modulator based on micro-mirrors was used as the image source. This patent also describes the digital micro-mirror device (DMD) as a reflective-type binary spatial light modulator.

Geng describes another volumetric 3D display system that projects images directly to a rotating helical screen. Conventional 2D color projector setup was used to create color images.

Hamada describes an illumination technique for color display systems that generates illumination beams of different primary colors with different incidence angles and then focuses them onto different pixel locations through the use a proximity micro-lens array.

Nishihara describes an illumination technique that improves over Hamada by incorporating micro-prisms structure into the micro-lens array to improve resolution over small sized LCD panels.

Joubert et al. describes an illumination technique for color display systems that uses a grating system to separate R, G and B colors on a micro-scale and then uses a micro-lens array to focus the R, G and B spots to different pixel locations. The function of the grating system and the micro-lens array can be integrated into a holographic element.

Morris et al. describes a system similar to Joubert et al. that uses a micro-lens array with built-in gratings.

Kim & Hwang describes the thin-film micro-mirror array (TMA) as a reflective-type spatial light modulator with gray scale capability.

The "Displaytech Display" product manual describes the use of FLC-based binary display and field sequential technique to create 2D color images.

Rosenbluth & Singh describes methods of lamp light rays recycling methods.

The "Integrated Circuit Spatial Light Modulators - FLC" product manual describes an optical correlator using 2 FLC-based binary spatial light modulator.

Very respectfully,

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Date of submission of this form: 12/12/2001